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THE 1969 GARDEN TOUR

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From May 8 to June 6 my wife and I conducted a group of 41 persons (about half of them present or former students of the Arboretum school) on a garden tour of the Hawaiian Islands, Japan and Taiwan. We departed from Los Angeles by regularly scheduled jet flight on Thursday, May 8, and arrived that afternoon at Hilo on the island of Hawaii.

For those with little or no knowledge of tropical vegetation the plantings around our waterfront hotel provided a good introduction. As is usually the case in resort areas many of the most showy plants were exotics. Here, for example, was the sea almond (*Terminalia Catappa,* a native of the Old World tropics) with large leathery leaves borne on low horizontal branches. Here was the African tulip tree (*Spathodea campanulata*) with its large, scarlet cup-shaped flowers. The Australian "pine", not a pine at all but a flowering plant (*Casuarina equisetoides*), was everywhere in evidence and specimens on the hotel grounds had been pruned into low hemispherical shapes. (Fig. 1) There were enormous flat-topped specimens of the monkey pod tree (*Samanea Saman*) a native of the American tropics and one huge example of the fish-poison tree (*Barringtonia asiatica*) laden with large wooden four-sided fruits. Hibiscus, Bougainvillea and Oleander were, of course, all around us.

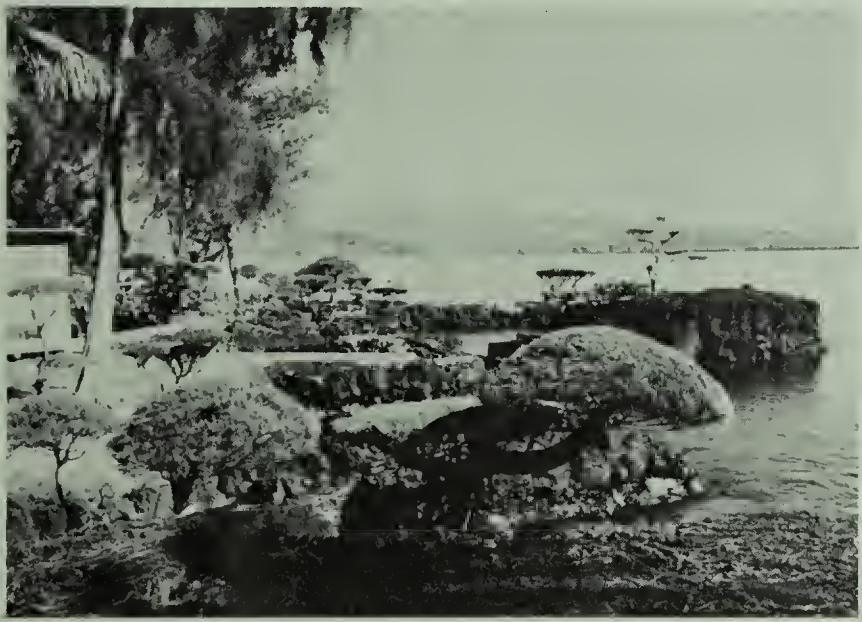

Fig. 1. Waterfront at Hilo

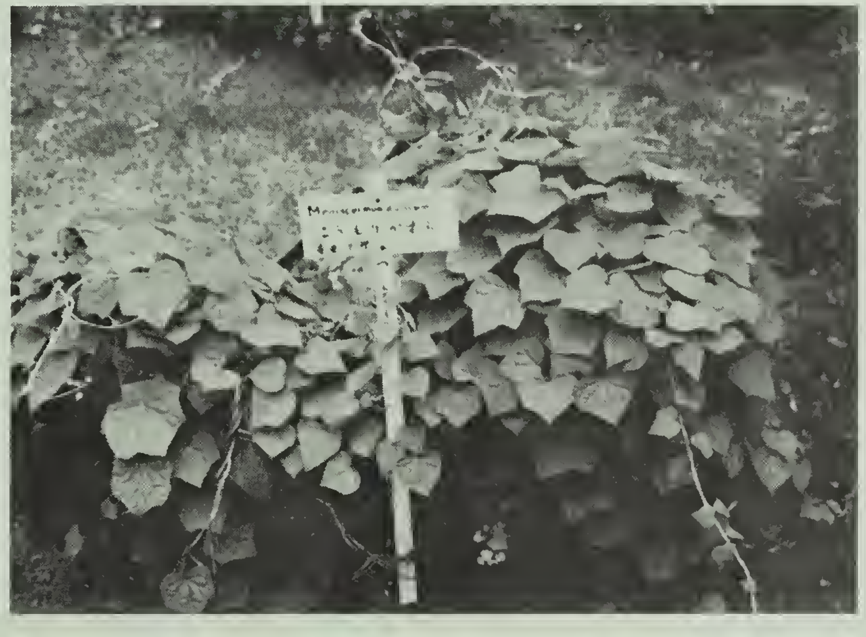

Fig. 2. *Menispermum dauricum*

The road behind the hotel was lined with a double row of banyans (*Ficus bengalensis*), each commemorating the visit to Hilo of some celebrity such as an athlete, actor or statesman. A short distance farther on was a delightful Japanese garden which furnished a pre-view of some of the gardens we were to see later on our tour.

On Friday, May 9 we first paid a visit to Rainbow Falls, an impressive cataract which plunges into a deep hollow in the volcanic rocks, and then inspected a nursery where orchids, anthuriums and other tropical ornamentals are grown on a large scale.

We then drove to Hawaii National Park to witness the fabulous volcanic manifestations of Kilauea. As we stood on the edge of the main crater the ascending clouds of steam were so dense that we were unable to see the

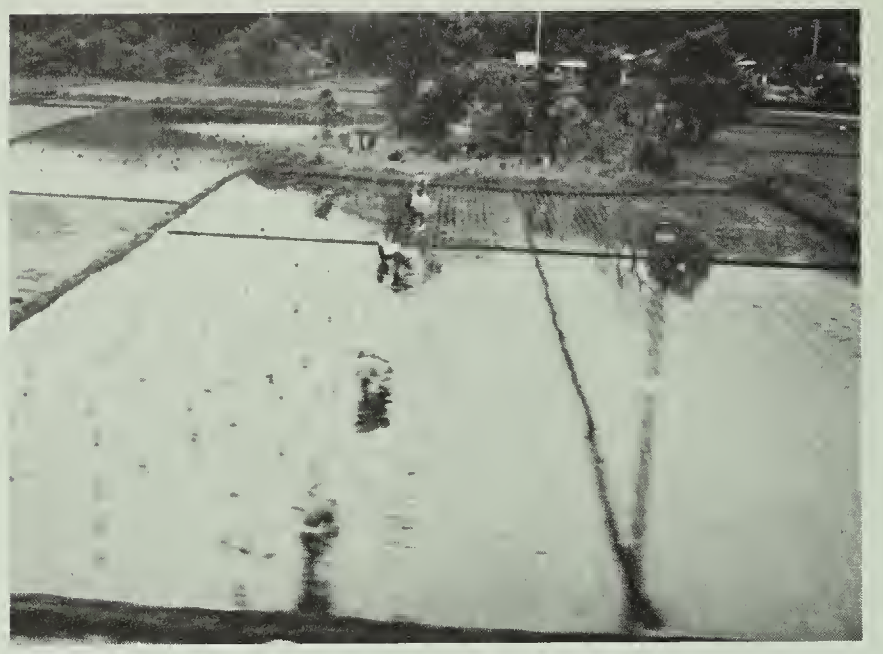

Fig. 3. Paddy-fields en route to Nikko

opposite rim. Two weeks later, while we were in Japan, we read that Kilauea had erupted, its first major performance since 1959.

The morning also included a visit to a forest of giant tree ferns and a walk through a lava tube. These fantastic tunnels are formed by rivers of fire rushing through the cooler lava.

Luncheon was in the restaurant of Volcano House on the edge of a caldera which is formed by the collapse of a crater. This one was two miles in diameter, its floor composed of recent lava flows. We later visited the Sulphur Banks, where clouds of sulphur steam are constantly arising from a series of vents and the ground is heavily encrusted with sulphur.

The flora of National Park is understandably meager, but one shrub or small tree which was predominant was the Ohi'a Lehua. This is *Metrosideros collina*, a member of the Myrtaceae with leathery leaves and bright red flowers looking like pompoms. Another plant which intrigued us was a low species of *Styphelia*. This genus belongs to the Epacridaceae, a family which in the Pacific and the Southern Hemisphere takes the place of the Ericaceae, to which it is closely related. Still another was an evergreen blueberry (*Vaccinium reticulatum*).

Later in the afternoon we drove to Kalapanos black sand beach which has been formed by the weathering of a dark brown or blackish lava. Conspicuous here was the succulent shrub *Scaevola* and growing with it *Ipomaea pes-caprae,* the goat-foot morning glory which occurs on tropical beaches the world over.

The next morning, Saturday, May 10, we flew to Honolulu, arriving in time for a swim and lunch before departing for the Polynesian Cultural Center where we visited the reproductions of six different Polynesian villages, had a Polynesian dinner, and attended a performance of Polynesian dances and music in an outdoor theater.

On Sunday morning we paid a visit to the Foster Botanical Garden where our guide was Mrs. J.D. Babcock, Chairman of the Volunteer Guides. This garden had its beginning in 1855 when Dr. William Hillebrand, author of the celebrated "Flora of the Hawaiian Islands," acquired the property which he later sold to Captain Thomas Foster who in 1930 bequeathed it to the City of Honolulu.

Today the garden comprises about 20 acres and contains a distinguished collection of tropical species. The first section we visited was devoted entirely to bromeliads or so-called "tank epiphytes." Most of these are indigenous to the American tropics where they are represented by species as diversified in appearance and manner of growth as the pineapple and the Spanish or Florida "moss", which of course is in no sense a true moss.

Another area of the garden was dedicated to epiphytic as well as terrestrial orchids, the New World and Old World genera occupying separate sections.

Of the countless fine, old mature trees only the following few, selected at random, can be enumerated in this brief account:

Ficus benjamina. A weeping banyan from India with a snake-like system of surface roots.

F. religiosa. The famous bo or peepul tree of the Buddhists.

Enterolobium cyclocarpum. Earpod, elephant's ear. A huge tropical American member of the Leguminosae in which the circular shiny pods are shaped like an ear.

Kigelia pinnata. Sausage tree. Notable for its cylindrical, gray, sausage-like fruits which are suspended on elongated stalks.

Couroupita guianensis. Cannon-ball tree. Its name derives from the heavy spherical fruit. On the occasion of our visit the tree in the garden was in flower.

Canavallisia elata. This lofty tree, with a smooth, slightly swollen trunk, is a member of the Bombaceae or Silk-cotton Family.

Hydnocarpus anthelmintica. Chalmoogra. This is the Burmese tree, the oil from which has been used in the treatment of leprosy and other skin afflictions.

One of the most fascinating features of this garden is the Prehistoric Dell. Here are to be found plants which flourished millions of years before the advent of the

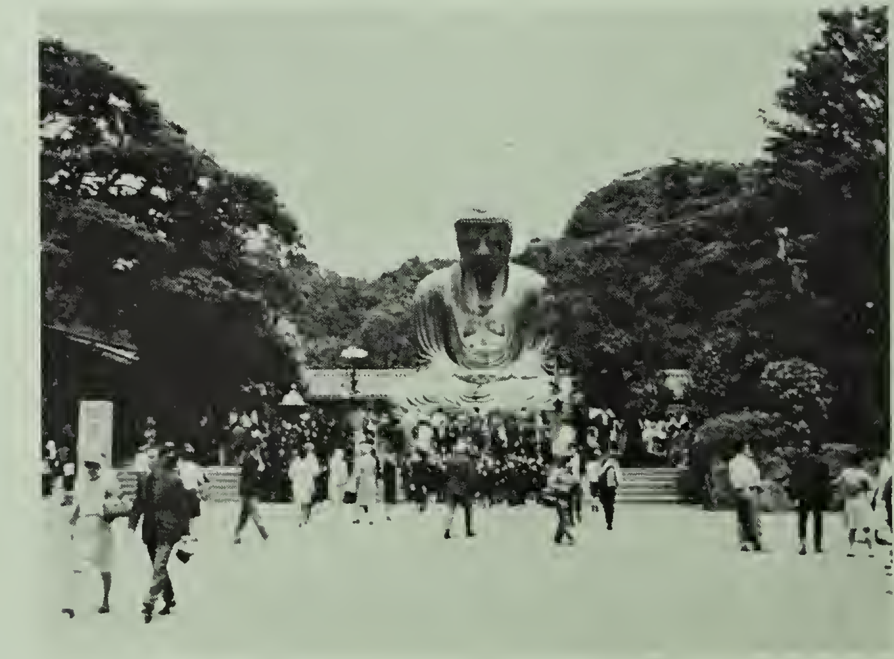

Fig. 4. The sitting Buddha at Kamakura

Fig. 5. Mt. Fuji

modern floras. The collection includes *Psilotum* (which may have been among the first kinds of plant to become adapted to terrestrial existence) primitive ferns, horsetails, lycopods and, of course, cycads.

The garden also includes collections of economic and medicinal plants. Our morning spent with Mrs. Babcock in these collections was one of the most rewarding experiences of the entire tour.

The following afternoon, Monday, May 12, we left Honolulu for Tokyo, crossing the International Date Line and arriving at our hotel on the evening of May 13.

I had naively assumed that since Tokyo is at about the same latitude as Durham, N.C. and since such overwhelming numbers of Japanese plants are cultivated in eastern temperate North America, we would be able to recognize practically everything that we saw. Such, however, was far from being the case, as we soon discovered.

Adjoining our hotel was a Shinto shrine surrounded by a wealth of what appeared to be native vegetation. At first we felt very much at home, for here were such familiar species as *Torreya nucifera, Zelkova serrata, Idesia polycarpa, Ilex serrata* and *Cornus controversa.* Growing with them, however, was an evergreen tree with staminate flowers in long narrow spikes. It simply had to be a member of the Fagaceae or Beech Family, but was neither a beech, an oak nor a chestnut. We knew it was probably not a *Nothofagus,* from the Southern Hemisphere, so by a process of elimination, we took it to be a *Castanopsis.* This guess was later confirmed by a competent taxonomist, who identified it as *C. cuspidata,* a species we were to see everywhere throughout our travels on the island of Honshu. Rehder says that none of the Chinese species of this genus has proved hardy in our area, but one of us at least is determined to experiment with this fine Japanese tree.

Among the other unfamiliar plants we encountered here, on our first morning in Japan, were *Mallotus japonica* (an arboreal member of the Euphorbiaceae) and *Eurya japonica* (an evergreen shrub belonging to the Theaceae or Tea family). Rehder lists this species as adapted only to Zone VII, but again one wonders whether a hardy strain might not be found to succeed in our area. After all, we can grow the related *Cleyera japonica* (not even included in Rehder) which at the time these lines are written (July) is in full flower at the Barnes Arboretum.

Rhaphiolepis umbellata, the so-called Yeddo hawthorn, an evergreen shrubby member of the Rosaceae with leathery leaves and pinkish flowers, was in evidence everywhere as a hedge plant and along boulevards.

Our program on that day (May 14) included a city sight-seeing tour and a barbecue luncheon at the beautiful Chinzan-So garden restaurant. Following the first of our many chop-stick meals we wandered around the spacious grounds replete with azaleas, the late-flowering cherries and a baffling array of broad-leaved evergreens. Among the last-named was a tall *Viburnum,* which was later identified for us as *V. Awabuki* (probably synonymous with *V. odoratissimum*), another possible candidate for eastern American gardens.

The following day was devoted to visiting the Botanical Gardens of the University of Tokyo. Here we were graciously received by Dr. Tamotsu Hashimoto, Plant Taxonomist and Horticulturist, who conducted us through the 40 acres of this fine collection of native and exotic plants.

The flora of Japan includes at least half a dozen species of evergreen oaks and it was here that for the first (but not the last) time we saw *Quercus paucidentata, Q. phillyreoides* and *Q. glauca.* Incidentally, a small tree of the last-named species has survived several winters at the Barnes Arboretum which, once more, makes one wonder whether we have fully explored the hardiness potential of Japanese species in our area.

As is often the case in gardens affiliated with teaching institutions, there was here a large section in which the plants were arranged according to their systematic relationships. Among the interesting species in this assemblage were *Serissa japonica,* a low evergreen shrub with attractive white flowers belonging to the Rubiaceae, and *Menispermum dauricum.* (Fig. 2) The latter is one of several examples of a genus with only two species, one native to eastern United

Fig. 6. View in Kobe City Arboretum

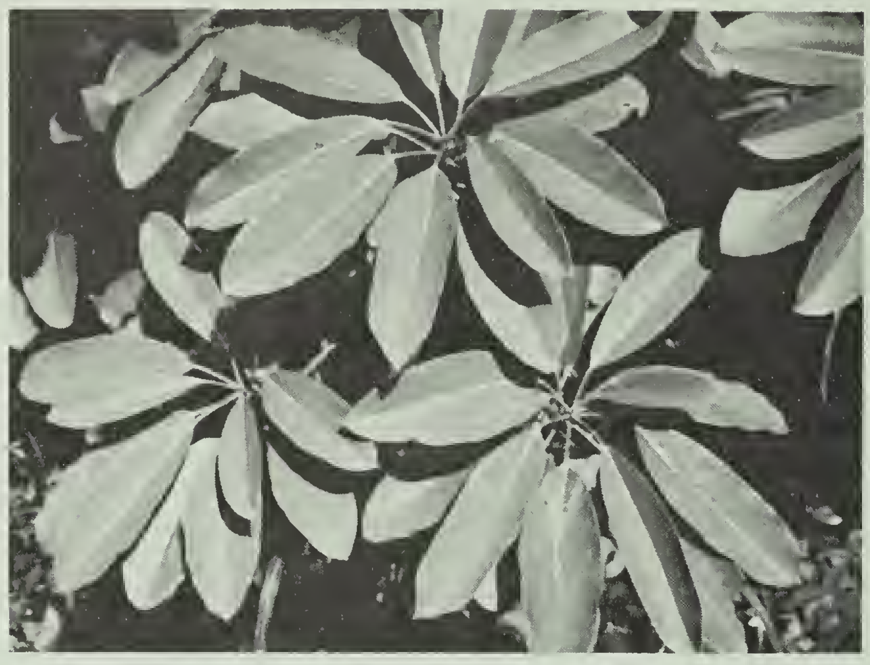

Fig. 7. *Daphniphyllum macropodum* in Kobe Arboretum

States (*M. canadense*) and the other indigenous to eastern Asia.

Even the briefest enumeration of the other fascinating plants in this garden would be entirely beyond the limits of this brief chronicle. Suffice it to say that we were impressed by the stately trees of camphor (*Cinnamonum Camphora*), the luxuriance of the Chinese fringe tree (*Loropetalum chinense*–just barely hardy with us), the handsome plants of *Ilex latifolia* and tall, robust specimens of *Ternstroemia japonica.*

The following day (Friday, May 16) we left by the "Dream Train" for the two hour ride to Nikko.

The view from the train was one of never-failing interest. There is something about a paddy field that fires the imagination of most Occidentals and on this ride we passed through many miles of them. In some areas the rice seedlings were still in the nursery, in others they had already been set out. In a few cases, however, we saw the young plants actually being placed in geometrically perfect rows by workers shin-deep in water. (Fig. 3)

At one place we passed a section of the old Hokkaido road, which used to traverse the island from north to south, and is lined by a double avenue of *Cryptomeria japonica.* In other spots we saw colonies of our own native black locust (*Robinia Pseudoacacia*) completely naturalized. We have finally become hardened to the wide-spread occurrence of this tree, having seen it on previous tours thoroughly established in Andorra, Italy, Jugoslavia and Greece.

Exciting as was the train ride, the culminating experience of the day was of course Nikko, with its magnificent buildings and superb setting. The largest of the century-old trees were probably *Cryptomeria* with trunks often four feet in diameter. With them, however, were giant specimens of Sawara cypress (*Chamaecyparis pisifera*), Japanese umbrella pine (*Sciadopitys verticillata*) and Japanese arborvitae (*Thuja Standishii*). For those of us who are inclined to regard it as somewhat "temperamental", it was intriguing to see *Thujopsis dolabrata* here growing luxuriantly.

Following luncheon at a nearby hotel we paid a visit to the Nikko Botanical Garden which is a branch of the University Garden in Tokyo. Here the Superintendent, Mr. Hideo Kobuto, was on hand to receive us and Dr. Hashimoto had kindly come up from Tokyo to help show us around.

This garden, which is laid out on undulating terrain, nestles in a valley surrounded by towering mountains. It contains a fine rock garden, with many alpine and sub-alpine species and an excellent collection of trees and shrubs, some of the former of huge size.

Among the conifers seen here were *Abies firma, Larix leptolepis, Pinus koraiensis* and *Tsuga diversifolia,* all of which we know in cultivation. *Fagus crenata,* an important forest tree throughout most of Japan, was new to most of us, as were *Salix Reinii* and *Prunus verecunda.* Several species of Rhododendron were in flower (*R. Metternichii, R. semibarbatum* and *R. Schlippenbachii*) and *Vaccinium Oldhamii* was in full fruit with bright red berries. It is, of course, not the only "blueberry" to have red fruit; *V. erythrocarpum,* of our southern mountains, is another and so are the cranberries, which also belong to the genus *Vaccinium.*

We were delighted to see *Acer carpinifolium,* a most unusual maple in which the leaves are pinnately rather than palmately veined.

And we were touched to see a modest specimen of our very own eastern bayberry (*Myrica pensylvanica*) just holding its own among these aristocrats of Honshu.

After an all-too-brief visit to this garden we drove up a highway said to have more than 48 hair-pin turns to view lake Chuzenzi, some 4000 feet above sea level. The forests here were made up largely of *Quercus mongolica* (which despite its specific name is also native to Japan) *Corylus Sieboldiana* and two species of *Carpinus (C. laxiflora* and *C. cordata*). In full flower everywhere were *Rhododendron Kaempferi* and *Sambucus Sieboldiana.* On the way down we stopped to admire the grandeur of Kegon Waterfall, which plunges more than 300 feet into a narrow gorge.

Fig. 8. Mt. Yotei

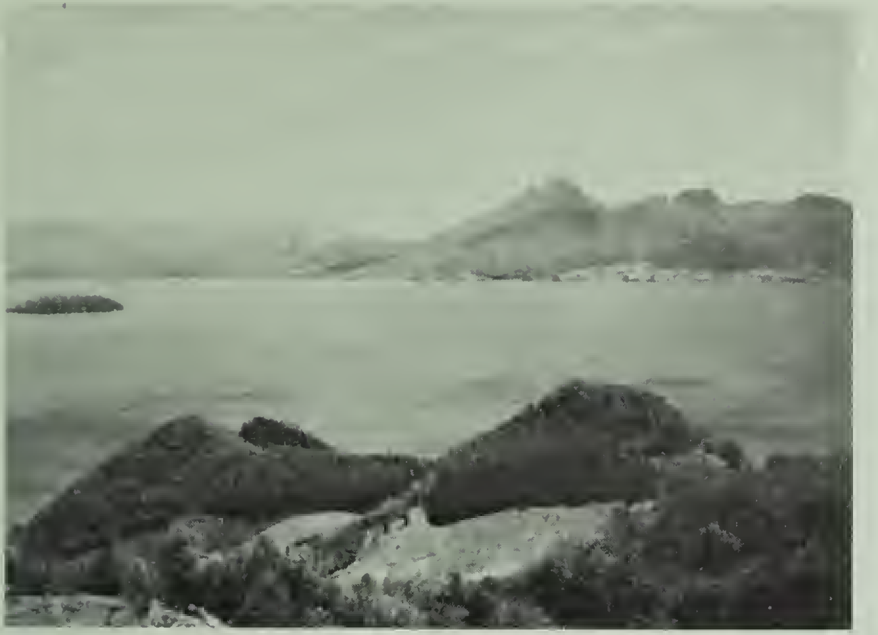

Fig. 9. Lake Toya

On May 17 we drove for about two hours out of Tokyo to visit the Bonsai Village of Omiya. Here is perhaps the greatest concentration of bonsai gardens to be found anywhere in the world. Unfortunately, weather-wise this was the worst day of the entire tour and we were treated to a steady downpour during our inspection of this superb collection of beautifully grown material. To those who had been members of our tour to the British Isles in 1967 this kind of downpour was an old story and, donning rain-hats and slickers, we slogged about with seemingly undaunted enthusiasm. For the camera fans, however, it was pretty much a lost day.

The following morning we departed from Tokyo by motor coach and drove first to Kamakura to view the immense outdoor image of Daibutsu—the sitting Buddha. (Fig. 4) The plants in the area surrounding this giant statue were intriguing. Most of them were evergreen trees or shrubs including *Quercus phillyreoides* and *Ternstroemia japonica* (both of which we had seen in the Botanical Garden in Tokyo). *Pasania edulis* (another evergreen member of the Fagaceae) and *Photinia glabra* (an evergreen shrub of the Rosaceae, which we were to see many times again) were also conspicuous.

Following luncheon in the Hayama Marina on the shores of the Pacific we drove first along the coast and then proceeded to climb up through the forests of Fuji-Hakone National Park to Myanoshito where we put in for two nights at the picturesque Fujiya Hotel.

The grounds of this hotel constitute a veritable botanical garden, with a varied collection of trees and shrubs, and a series of greenhouses containing a fine assortment of orchids, ferns, bromeliads, cacti, succulents and insectivorous plants.

On the morning of Monday, May 19, we drove through a region of thermal springs and ascended to a lookout point where we had a spectacular and unencumbered view of the symmetrical snow-capped cone of Mt. Fuji, an experience which is vouchsafed to very few travelers with only a single day in this area. (Fig. 5) We then descended to Lake Hakone where we boarded a boat and cruised across the lake, with frequent views of Fuji in the background.

That afternoon we took a walk along the road leading into the town and saw several interesting plants. Here was *Trochodendron,* which we had seen in Tokyo, but now in fruit with its wheel-like clusters of follicles. Here was *Podocarpus macrophyllus,* a primitive gymnosperm not quite hardy with us, but in its native habitat a good-sized evergreen tree. We also saw again *Eurya japonica* and *Ternstroemia japonica.* It was particularly fascinating to see growing here in the wild state a number of shrubs which are widely cultivated with us; these included: *Spiraea Thunbergii, Stephanandra incisa, Enkianthus campanulatus, Pieris japonica* and *Ligustrum japonicum.*

The mountain slopes across the valley from our hotel presented an interesting contrast of *Cornus controversa,* in full flower, intermixed with *Cryptomeria japonica.* This dogwood is, of course, closely related to our native *C. alternifolia,* the two species being remarkable in this genus because of their alternate rather than opposite leaf arrangement.

The following day we drove to Atami station where we boarded the "bullet train" for the three-hour ride to Kyoto. This train, which is capable of speeds well over a hundred miles an hour, is one of Japan's great achievements in the field of transportation.

One can spend many days in and around Kyoto, an ancient capital of Japan, visiting its shrines, temples, palaces and gardens. The following brief account must suffice to describe our activities during a stay of four very full days.

On Wednesday, May 21, we first visited the famous Golden Pavilion in its beautiful garden setting, where we were surprised to see *Quercus glauca* used as a hedge.

Other visits that day included the Ryonji temple and rock garden, the Nijo Palace, the Silver Pavilion and the Heinan Shrine. Some of us had been wondering why we had not been seeing the Japanese white pine (*Pinus parviflora*). Our concern was now set at rest, for this handsome species was much in evidence in the gardens in and around Kyoto.

The next day we drove to Nara (Japan's earliest capital) where our first visit was to the Todaji Temple (said to be the largest wooden building in the world) which houses a

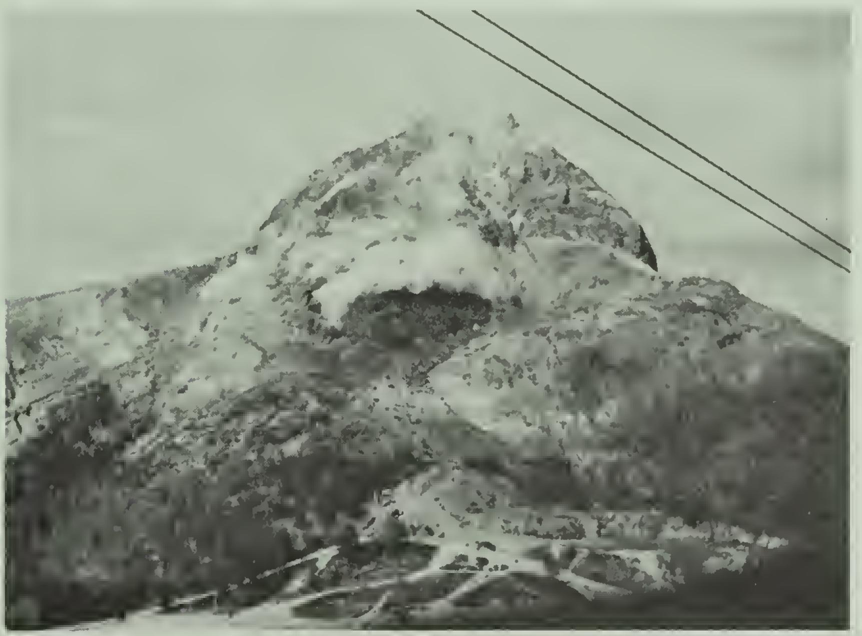

Fig. 10. Showa Shinzan

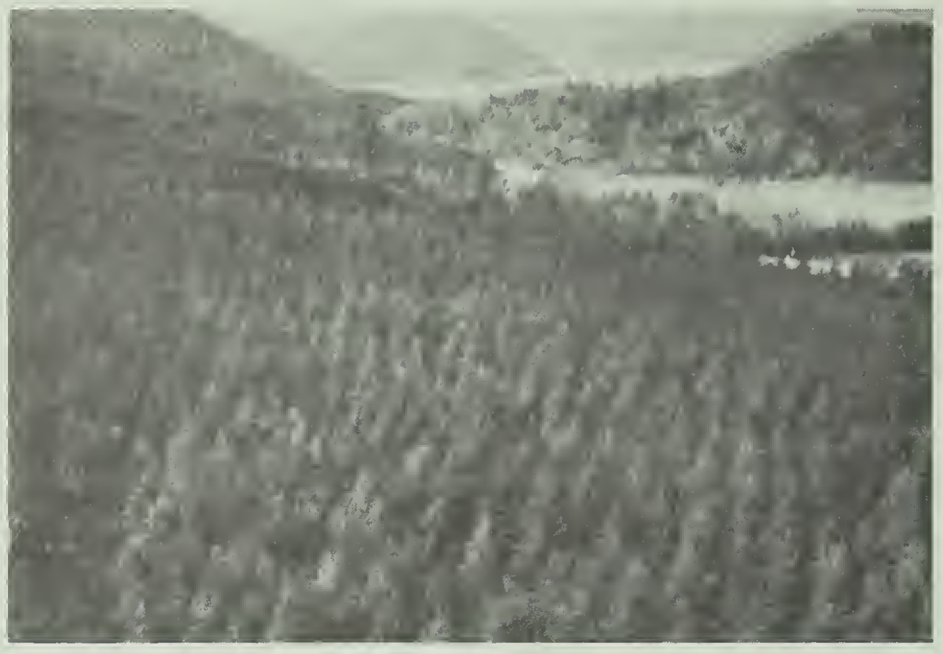

Fig. 11. Stand of *Larix leptolepis* with Lake Toya in background

huge bronze statue of Buddha. The low hedges lining the long walk leading to the temple were composed of *Photinia glabra,* here in full flower, its white corymbs contrasting pleasantly with the bronze foliage. We also paid our respects to the Kasuga Shrine, with its ascending avenue of thousands of stone lanterns and the renowned park of tame deer. Conspicuous here was another podocarp (*P. Nagi*), an impressive spreading evergreen tree.

Following luncheon at the Nara Hotel, on the shores of a picturesque lake, we visited the spectacular Samboin Garden of Daigoji Temple.

On Friday, May 23, we drove along the new expressway to Kobe, the second largest port in Japan and, after a morning of sight-seeing, followed a winding road up through many miles of wooded hills to the Kobe City Arboretum, where Mr. K. Maruyama was waiting to receive us. This fine municipal arboretum, which encompasses some 700 acres, is laid out on a rolling valley floor surrounded on all sides by lofty mountains. (Fig. 6) One of the specialties of this arboretum is its collection of conifers and the approach through a double lane of tall dawn red-woods (*Metasequoia*) prepares the visitor for the richness of this concentration, which occupies a kind of natural amphitheater not far from the main entrance. Practically every genus of the Gymnosperms hardy in the region, was represented here, but the pines were pre-eminent. Representing Europe were *P. sylvestris, P. Laricio,* and *P. Pinaster*: from western North America *P. ponderosa* and *P. Jeffreyi,* and from the eastern states *P. Banksiana* and *P. rigida.* We were pleased to see a specimen of *Cupressus arizonica,* as well as a small tree of *Chamaecyparis thyoides,* the latter a plant of our eastern Atlantic coastal plain.

One of the plants that most intrigued us was *Daphniphyllum macropodum,* an evergreen shrubby or arboreal member of the Euphorbiaceae, which we had seen last year at the Villa Taranto in northern Italy, but which was here growing in its native land. (Fig. 7) Among other unusual or unfamiliar plants we saw on our walk through the arboretum were: two "new" oaks (*Q. myrsinaefolia* and *Q. serrata*), *Michelia compacta* (an evergreen relative of *Magnolia*), *Illicium anisatum* (another evergreen member of the Magnoliaceae), *Pourthiaea villosa* and *Crataegus crenata* (both of the Rosaceae), *Hydrangea scandens, Edgeworthia papyrifera* (Thymelaeaceae) and *Abelia serrata* (which many of us took to be a *Kolkwitzia*).

The next day featured a visit to the Botanical Garden of Osaka City University where the Director, Dr. Hideo Takada, and the members of his staff extended a warm welcome to the members of our party. This garden of about 75 acres is also laid out on undulating ground, predominated by native coniferous and deciduous tree species. In addition to the plants we had previously seen, such as *Pasania edulis* and *Castanopsis cuspidata,* were another "new" Oak (*Q. Gilva*), another *Michelia* (*M. fuscata*), two Magnolias widely cultivated "back home" (*M. Kobus* and *M. salicifolia.*) and a "buckeye" which does very well in the Barnes Arboretum (*Aesculus turbinata*). We were also edified to see *Chamaerops humilis* (the only palm indigenous to southern Europe), *Myrica rubra, Machilus japonicus* (an evergreen shrub of the Lauraceae), *Lyonia ovalifolia* (looking for all the world like a *Leucothoe*) and *Distylium racemosum,* an evergreen member of the Hamamelidaceae which we are currently attempting to grow at the Barnes Arboretum.

In addition to its rich collection of native and exotic trees and shrubs, this garden contains a section devoted to desert plants (including several species of *Yucca* from our southwestern states), a series of perennial borders, a fine exhibit of bonsai and greenhouses replete with a wealth of tropical and subtropical material, including cacti and succulents. Of unique interest was a bench containing over 40 species of *Selaginella.*

On Sunday, May 25, our party flew from Kyoto to Tokyo where we changed planes for the flight to Sapporo in the northern island of Hokkaido. Although we had been too late to see most of the flowering cherries and many of the azaleas in Tokyo, here, much farther north, they were just coming into their own. It was a little like going from Washington to Boston in the spring.

Sapporo boasts an excellent botanical garden which is under the jurisdiction of the Faculty of Agriculture of Hokkaido University. Our group was welcomed there the following day by Dr. T. Tsujii, the Curator, who graciously devoted the morning to showing us around. As might be expected, this garden is rich in species native to the northern island and the representation of alpine and subalpine species in its rock garden is truly superb. Most of the gardens we had visited were of comparatively recent origin, but the one at Sapporo dates from the 1880's and the trees were correspondingly larger and more impressive. One specimen of Japanese yew (*Taxus cuspidata*) must have been at least 30 feet tall. One of the special features of the garden is a collection of hardy ferns and related Pteridophytes.

The following morning we left Sapporo and drove southward through magnificent mountainous country to Shikotsu-Toya National Park. We had been seeing several

Japanese species of maple (especially *Acer palmatum*), but now they became a dominant component of the forests, their light pink foliage imparting a delicate charm to the hillsides. Mingled with the maples were at least two species of *Sorbus* and the Katsura tree (*Cercidiphyllum japonicum*), of which the early foliage is a light bronze. A spruce (*Picea jezoensis*) and a fir (*Abies sachalinensis*) were of frequent occurrence, while the most conspicuous shrub was *Viburnum plicatum,* here in full flower.

Our road took us through Nakayama Pass and after a winding ascent of many miles we reached a promontory which offered a majestic view of Mt. Yotei, often called Hokkaido's (or Yedo's) Fuji. Although less than half as high as Fujiyama, it has the same perfect conical shape and snow-capped summit. (Fig. 8)

Continuing on, we descended by a narrow, winding mountain road and came at last to the shores of Lake Toya, a superb body of water occupying the crater of an extinct volcano. (Fig. 9) Our destination was the Manseikaku Hotel, in the town of Shikotsu, on the northern edge of the lake. Following a late luncheon we set out to visit Japan's most recent volcano, Showa Shinzan, which started to erupt in 1943. Although no longer emitting lava, it gives forth great clouds of steam from its upper slopes. (Fig. 10) In order to gain a better view of this baby volcano we took a cable car to the summit of a much older volcanic peak. On the ascent we passed over a dense solid stand of Japanese larch (*Larix leptolepis*) and from the top we had a marvelous view of Lake Toya with the Pacific Ocean in the distance. (Fig. 11)

On the morning of the 28th we went for a cruise on the lake, stopping at a forestry station where there was an interesting natural history museum. Later we drove completely around the lake visiting an ancient shrine en route. That evening all of us donned our kimonos and had a special Japanese dinner, replete with Geisha girls.

On our last morning in Hokkaido we drove to Jozankei Spa, a region of thermal springs and effervescent sulphur vents. About the only tree which seemed able to withstand these noxious fumes was *Sorbus commixta,* another species which grows well in the Arboretum. This was followed by a cable car ascent, this time to visit a reservation of the native black bears of Hokkaido. On the way to the top we were pleasantly surprised to see many trees of *Magnolia obovata* in flower. Since this species is closely related to our American umbrella magnolia (*M. tripetala*), this is a further example of the affinity between the floras of Japan and the eastern United States which was noted over two centuries ago by a student of Linnaeus.

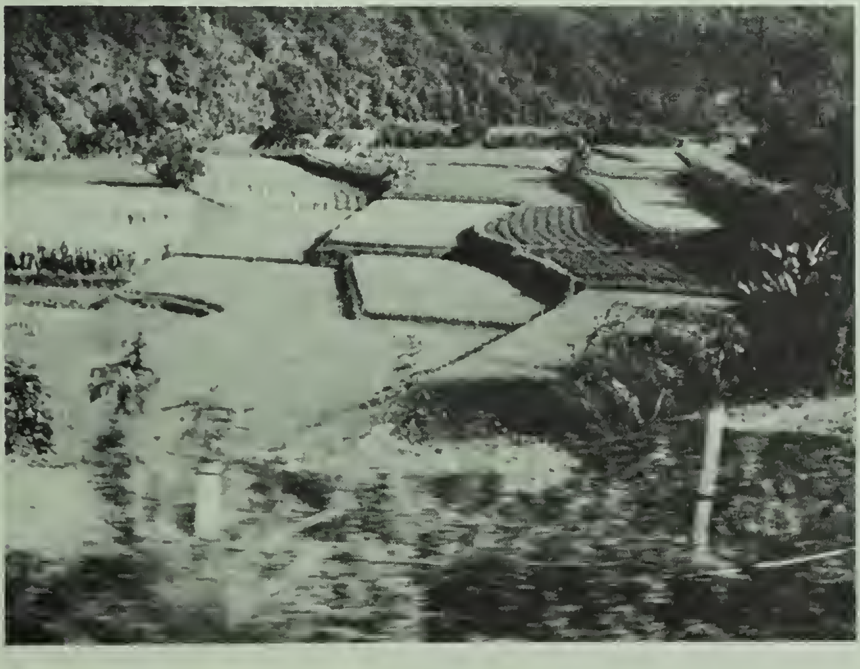

Fig. 12. Terraced paddyfields en route to Sun Moon Lake

After driving for many miles along the shores of the Pacific, we made a stop at the Ainu village of Shiraoi to witness a native dance. This ethnic group, of obscure origin, is fast disappearing through intermarriage with the Japanese, and "touristy" though this visit was, we are rather glad to have made it. In early afternoon we took the plane at Sapporo airport for the flight back to Tokyo.

On Friday, May 30, when our tour was just three weeks old, slightly more than half of the group left for home, while 18 of us flew to Tapei, the capital of Taiwan, the Republic of China, where we were quartered in the fabulously ornamental Grand Hotel.

Since Taiwan lies athwart the Tropic of Cancer, which also passes almost through Havana, Cuba, it would be expected that its vegetation and introduced flora would be predominantly sub-tropical. This supposition was abundantly confirmed the following morning when a casual inspection of the plants around the hotel revealed several cycads, palms, bamboos, and such genera as *Thevetia* (Apocynaceae) and *Erythrina* (Leguminosae).

Our program that morning included a visit to the relatively new National Museum, with its priceless collection of ancient Chinese art treasures, Lungshan Temple, the Confucious Shrine and the National Botanical Garden, which is affiliated with the Department of Agriculture and Forestry. Among the many interesting trees which we saw in this 40-acre garden were an enormous specimen of bread-fruit (*Artocarpus communis*), the Chinese pistachio (*Pistacia chinensis*), *Dalbergia Sisso* (a native of India), *Cordia myxa* (a member of the Boraginaceae), *Combretum grandiflorum* and *Diospyros utilis,* a little-known persimmon.

Those of us who know and admire our native sweet gum (*Liquidambar Styriciflua*) have often wondered whether it would be possible for us to grow its Formosan congener (*L. formosana*). To date our experiments have met with only indifferent success. It was, therefore, a matter of considerable interest to us to see this native species utilized as a ubiquitous street tree, as well as a component of the deciduous forest population. Another street tree of frequent occurrence in and around Taipei was the Chinese parasol-tree, *Firmiana simplex* (of the Sterculiaceae), planted for its large palmately-lobed leaves. This species, accredited by Rehder to Zone VII, is known to be marginally hardy as far north as the Brooklyn Botanic Garden, but to date we have not succeeded in growing it in the Philadelphia area.

On Sunday (June 1) we visited the National Yangmingsham Park, a popular resort with its fountains, lily-ponds, wooded groves and exotic plantings of woody and herbaceous plants.

Returning from the Park we stopped along a wooded roadside to photograph paddy fields with water buffalo far below us. A striking plant was the shell ginger (*Alpinia nutans*) a native of the East Indies, but here thoroughly naturalized.

The following day we entrained on the Tourist Express for the three hour trip to Taichung where, following lunch, we embussed on a two-hour drive to Sun Moon Lake, one of the renowned beauty spots of Taiwan. This drive took us through terraced paddy fields (Fig. 12) where the rice was ready for harvest, plantations of black pepper (*Piper nigrum*—a native of the Oriental tropics) and as the road climbed into the mountains, great stands of *Cunninghamia.* Since no species native to Formosa (Taiwan) is supposed to be hardy in our Middle States area this simply could not be *C. lanceolata,* which is widely cultivated with us, but rather the related *C. Konishii,* which differs in having narrower leaves and smaller cones.

Sun Moon Lake was originally two bodies of water, but the construction of a dam and the raising of the water level has resulted in their confluence. (Fig. 13) Our lake-front rooms in the Evergreen Hotel gave us a commanding view of this beautiful lake and the mountains surrounding it, a view which we enjoyed as the sun set and later by moonlight.

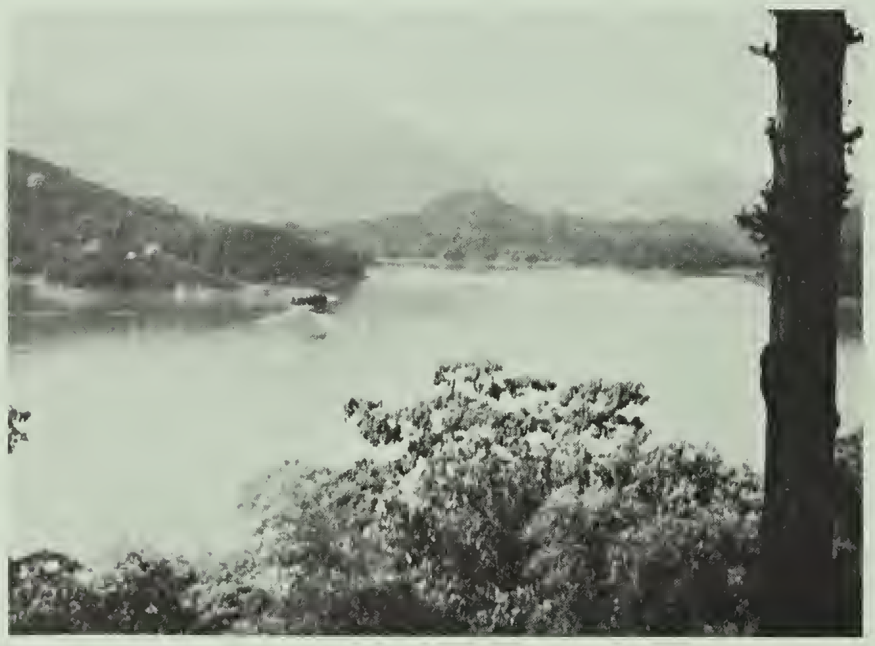

Fig. 13. Sun Moon Lake

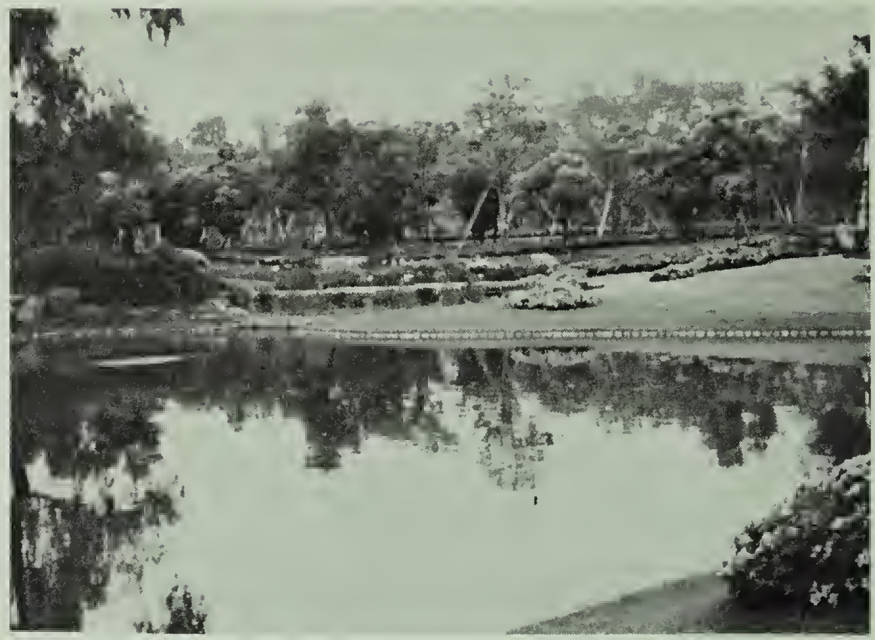

Fig. 14. View in Imperial Palace Gardens, Tokyo

The next morning we went for a cruise on the lake, stopping to inspect a shrine on the shore across from our hotel and climbing the dam breast for a view of two picturesque native villages far below. That afternoon we returned to Taipei.

On Wednesday, June 4, our last day in Taiwan, most of us returned to the National Museum for a more leisurely inspection of its collections and, after an early lunch, our guide took us to a beautiful garden owned by a retired general, but now open to the public. Late in the afternoon we left Taipei and flew back to Tokyo.

It was our good fortune to be in the capital on a day when the Imperial Palace Gardens were open to visitors and we spent part of the morning wandering through its spacious grounds. Especially elegant was the display of Japanese iris around a large pond with late azaleas in the background. (Fig. 14)

Late that afternoon we left for San Francisco and home and the 1969 Barnes Arboretum Garden Tour had come to an end.

The Meanings of Botanical Names

JOHN M. FOGG, JR.

(Continued from Number 2)

nucifera: Bearing nuts or nut-like structures.

nudiflorus: With "naked" flowers, i.e., flowers appearing before the leaves.

nudus: Nude, naked.

numidicus: Of Numidia, ancient country of north Africa.

nutans: Nodding or reflexed, as the peduncles of certain flowers.

oblatus: Oblate, a flattened sphere.

oblongus: Oblong, said of a leaf with margins mostly parallel.

obovatus: Inverted ovate, i.e., broadest beyond the middle, as of a leaf.

obtusus: Obtuse, blunt, as of the apex of a leaf.

occidentalis: Occidental, western, usually of the New World or perhaps western North America.

ochroleucus: Yellowish-white.

octandrus: With eight stamens.

octopetalus: With eight petals.

oculis-draconis: Dragon-eyed, applied to leaves of species of pines which have green and yellow bands.

odorus: Fragrant.

officinalis: Of the apothecary's shops, usually applied to plants of real or supposed medicinal value.

oligocarpus: With few fruit.

Omorika: Native name.

opacus: Opaque, not transparent.

oppositifolius: With opposite leaves, i.e., two leaves borne at same node.

opulifolius: With leaves like *Opulus,* a genus in the Caprifoliaceae.

orbiculatus: Rounded or circular, usually of the leaves.

oreophilus: Mountain-loving.

orientalis: Oriental, eastern, often referring to eastern Asia.

ornatus: Ornamented, adorned.

Ornus: Generic name.

ovalifolius: With oval leaves.

ovalis: Oval, ellipsoidal.

ovatus: Ovate, said of a leaf which is broader below the middle.

Oxyacantha: Generic name.

oxyacanthoides: Resembling *Oxyacantha,* a name formerly applied to *Mespilus,* a genus in the Rosaceae; sharp-pointed.

Oxycoccus: Generic name.

oxyphyllus: With sharp-pointed leaves.

oxysepalus: With sharp or pointed sepals.

pachyphyllus: With thick leaves.

pallidus: Pallid, pale.

palmatus: Palmate, usually with compound or finger-like spreading leaves or leaflets.

palustris: Of swamps or marshes.

panduratus: Fiddle-shaped.

paniculatus: Paniculate, with flowers in compound racemes or trusses.

pannosus: Ragged, tattered.

papyrifera: Paper-bearing or with bark peeling in thin paper-like strips or patches.

parvifolius: With small leaves.

parviflorus: With small flowers.

patens: Spreading.

patulus: Spreading.

pauciflorus: With few flowers.

Pavia: Generic name.

Pecan: Generic name.

pectinatus: Comb-like, pinnatifid with narrow closely divided leaves.

pedunculosus: With many flower stalks or peduncles.

peltatus: Shield-shaped.

pendulus: Pendulous, hanging, drooping.

pentandrus: With five stamens.

pentaphyllus: With five leaves (or leaflets).

peregrinus: Exotic, foreign, from a strange country, wandering.

perfoliatus: With the leaf (seemingly) surrounding the stem.

perpusillus: Exceptionally small

Persica: Generic name.

persicus: Of Persia, also the peach.

perulatus: Wallet-like or pocket-like.

petiolaris: With a petiole or leaf stalk.

petraeus: Rock-loving.

Peuce: Generic name.

phillyreoides: Resembling *Phillyrea,* a genus in the Olive Family.

Phellos: Generic name.

phoenicolasius: With purple-red hairs.

pictus: Painted.

pileatus: With a cap or crest.

pilosus: Pilose, shaggy, with soft hairs.

pinnatifolius: With pinnately compound leaves.

pinnatus: Pinnate, with veins or leaflets arranged like the feathers of a bird, rather than palmate.

pisifera: Pea-bearing or bearing small pea-like bodies, e.g., cones.

planifolius: With flat leaves.

planispinus: With flat spines.

platanoides: Resembling *Platanus,* the plane tree or buttonwood.

platypetalus: With broad petals.

platyphyllus: With broad leaves.

plenus: Full, usually referring to double-flowered.

plicatus: plicate, plaited, folded.

plumarius: Plumed.

pluribracteatus: With numerous bracts.
podocarpus: With stalked fruit.
polifolius: With leaves like those of *Polium*, a genus in the Labiatae.
politus: Polished, smooth.
polycarpus: With many fruits.
polygamus: With the sexes mixed on the same plant.
pomifera: Bearing pomes.
ponderosus: Heavy, massive.
ponticus: Of Pontus, in Asia Minor.
populifolius: With leaves like *Populus*, poplar.
poukhanensis: Of Pouk Han, Korea.
praecox: Precocious, early flowering.
pratensis: Of meadows.
primulinus: Resembling *Primula*, primrose.
procerus: Tall, lofty.
procumbens: Procumbent, flat or trailing.
prostratus: Prostrate, lying flat.
pruninosus: With a hoary bloom, as on the fruit.
prunifolius: With leaves like *Prunus*, cherry.
Pseudo-acacia: Generic name.
Pseudo-platanus: False *Platanus*, or false plane tree.
pubescens: Downy, hairy.
pulchellus: Pretty, beautiful.
pulcher, pulchra, pulchrum: Handsome, beautiful.
pulcherrimus: Very handsome.
pullus: Dark-colored, dusky.
pulverulentus: Powdered, dust-covered.
pumilus: Dwarf.
punctatus: Punctate, dotted.
pungens: Piercing, sharp-pointed.
puniceus: Reddish-purple, crimson.
purpurascens: Becoming purple.
purpureus: Purple.
pygmaeus: Pigmy or very small.
pyramidalis: Pyramidal, as of the shape of a tree or an inflorescence.
pyriformis: Pear-shaped.
quadrangulatus: Four-angled or four-sided.
quercifolius: With leaves like *Quercus*, oak.
quinatus: In fives, as of the leaflets of a palmately compound leaf.
quinquefolius: With five leaves or leaflets.
racemiflorus: With flowers in racemes.
racemosus: With flowers in racemes, i.e., a simple axis with flowers on stalks or pedicels.
radiatus: Rayed, spreading in all directions.
radicans: Rooting.
ramosus: Branched.
recognitus: Restudied.
reclinatus: Bent back.
rectus: Straight, upright.
recurvus: Recurved.
reflexus: Reflexed, bent back.
regius: Royal, kingly.
reniformis: Kidney-shaped.
repandens: Bent backward or curved; having a wavy margin as in some leaves.
repens: Creeping.
reticulatus: Reticulate, netted, netted-veined as of a leaf.
retusus: Notched at the apex as in some leaves and petals.
revolutus: Rolled backwards as in the margins of some leaves.
rhamnoides: Resembling *Rhamnus*, buckthorn.
rhytidophyllus: With wrinkled leaves.
rigidus: Rigid, stiff.
riparius: Of river banks.
robur: Strong.
robustus: Strong, robust.
roseo-marginatus: Leaves with pinkish margins.
roseus: Rosy, pink.
rosmarinifolius: With leaves like *Rosmarinus*, rosemary.
rostratus: Beaked.
rotundifolius: With round leaves.
ruber, rubra, rubrum: Red, ruddy.
rubellus: Reddish.
rubens: Red, ruddy.
rubiginosus: Rusty.
rufidulus: Reddish.
rufinervis: With red or reddish nerves or veins.
rugosus: Rugose, wrinkled.
rupestris: Rock-loving.
rusticus: Rusty.
sachalinensis: Of Saghalin Island, northern Japan.
saccharinus: Saccharine, sugary (in the case of *Acer saccharinum*, probably a misnomer).
saccharum: Sugar.
salicifolius: With leaves like *Salix*, willow.
salvifolius: With leaves like *Salvia*, sage.
sanguineus: Bloody, blood-red.
sarmentosus: Bearing runners.
Sasanqua: Native name.
sativus: Cultivated.
saxatilis: Found among rocks.
scaber, scabra, scabrum: Scabrous, rough.
scandens: Climbing.
sclerophyllus: With hard leaves.
scoparius: Broom or broom-like.
scutatus: Shield-shaped.
sebifera: Bearing or producing wax or tallow.
secundus: With flowers borne on one side of stalk.
sempervirens: Evergreen.
septentrionalis: Northern.
sericeus: Silky.
serotinus: Late-flowering or late-ripening.
Serpyllum: Generic name.
serratus: Serrate, saw-toothed, as the margin of a leaf.
serrulatus: Somewhat serrate or saw-toothed.
serrulus: Serrate, saw-toothed.
sessilifolius: With sessile or stalkless leaves.
sessilis: Sessile, without a stalk or petiole.
setaceus: Bristle-like.
setigerus: Bristly, harsh.
similis: Like, similar.
simplex: Simple, unbranched.
simplicissimus: Simple, very simple, i.e. unbranched.
simulans: Resembling, similar to (as of another species)
sinuatus: Sinuate, wavy-margined.

sobolifera: With creeping underground stems.
sorbifolius: With leaves like *Sorbus*, mountain ash.
spathulatus: Spatula-shaped, a broad upper part tapering toward the base.
speciosus: Showy, good-looking.
spicatus: With flowers in spikes.
spinosissimus: Very spiny.
spiralis: Spiral, twisted.
splendens: Splendid.
squamatus: With small usually flattened scale-like leaves or bracts.
squarrosus: At right angles, as of leaves spreading outward from stems.
stans: Erect, upright.
stellatus: Stellate or star-like, as of leaf-hairs or flowers.
stenophyllus: With narrow leaves.
striatus: Striped.
stolonifera: Bearing or producing stolons or runners that take root.
strictus: Upright, erect.
strigosus: With sharp, stiff hairs.
strobilaceus: With flowers in a cone-like inflorescence.
Strobus: Generic name.
strumosus: Having cushion-like swellings.
subcanus: Slightly ash-colored, hoary.
subcordatus: Somewhat heart-shaped.
subulatus: Awl-shaped.
succedaneus: Substituted, taking the place of something else.
suffruticosus: Somewhat shrubby.
supinus: Prostrate.
suspensus: Suspended, hanging.
sylvaticus: Of forests.
sylvestris: Of woods or forests.
syriacus: Of Syria.
tabulaeformis: Table-like or flat-topped.
taiwanensis: Of Taiwan (Formosa).
tardus: Late-flowered or late-fruited.
tataricus: Of Tartary (old name for Central Asia).
tectorum: Of roofs or houses.
tenebrosus: Of dark or shaded places.
tenellus: Tender, soft.
tegmentosus: With a thick covering.
tenax: Tenacious, strong.
tenuis: Slender, thin.
terminalis: Terminal, at the end of a branch.
ternifolius: With leaves in threes.
tetragonus: Four-sided or four-angled.
Tetralix: Generic name.
thuringiacus: Of Thuringia, Germany.
thyoides: Resembling *Thuja*, arbor vitae.
thymifolius: With leaves like *Thymus*, thyme.
thyrsiflorus: With flowers in a thyrse or compound panicle.
tinctorius: Of dyes or the dyers' trade.
tomentosus: Densely woolly, as the surface of a leaf.
toringoides: Resembling toringo (*Malus*).
tortuosus: Contorted, twisted.
tremulus: Trembling, quivering.
triacanthophora: Bearing three spines.
triacanthos: With three spines.
trichocarpus: With hairy or spiny fruit.
trichotomus: Three-branched or forked.
tricuspidatus: Having three cusps or points.
trifoliatus: With three leaves or leaflets.
trilobus: Three-lobed.
tripetalus: With three petals.
tristis: Sad, bitter, dull.
trivialis: Common, ordinary.
turbinatus: Turbine-shaped.
turgidus: Inflated, full.
typhinus: Pertaining to fever.
ulmoides: Resembling *Ulmus*, elm.
umbellatus: With flowers in umbels, i.e., each flower on stalk of the same length.
umbraculifera: Umbrella-bearing, i.e., flat-topped.
umbrosus: Shade-loving.
uncinatus: Hooked.
undulatus: Wavy, as the margin of a leaf.
Unedo: Generic name.
uniflorus: With a single flower.
ussuriensis: Of the Ussuri River area, northeastern Asia.
utilis: Useful.
Uva-ursi: Generic name.
vagans: Wandering.
validus: Strong.
variegatus: Variegated, usually of different colors.
vegetus: Vigorous.
velutinus: Velvety, with soft pubescence.
venosus: Veiny.
venustus: Handsome, charming.
vernalis: Of spring, vernal.
verrucosus: Verrucose, warty.
verruculosus: Very warty.
versicolor: Variously colored or changing in color.
verticillatus: Verticillate, whorled, with leaves or flowers arranged in a circle around the stem.
verus: True or genuine.
vespertinus: Western.
vestitus: Covered or clothed, as with hairs.
villosus: Soft-hairy.
vinifera: Wine-bearing.
virens: Green.
virginalis: Of Virginia.
viridis: Green.
viridissimus: Greenest, very green.
viscidus: Viscid, sticky.
viscosepalus: With viscid or sticky sepals.
Vitis-idaea: Generic name.
vittatus: Striped.
vomitorius: Emetic.
vulgaris: Vulgar, common, usual.
xanthinus: Yellow.
Xylosteum: Generic name.
xanthocarpus: With yellow fruit.
yedoensis: Of Yedo, Japan.
yunnanensis: Of Yunnan Province, China.
zebrinus: With stripes like a zebra.

NOTES FROM THE ARBORETUM

THE STAFF

On May 9 Dr. Gordon took a group of Barnes students to visit the Phyto-Engineering Laboratory at the Agricultural Research Center in Beltsville, Md. On May 23 and 24 he and Mrs. Gordon served as "resource specialists" at a Columbus Outdoor Education Workshop at Spring Hollow, Ohio. During 1969 the National Audubon Society has published the 7th printing of a folder on "Poison Ivy and other poisonous plants." The revision of an earlier printing has been undertaken by Dr. Gordon and Charles E. Mohr. At the eleventh International Congress, held in Seattle, Dr. Gordon presented four demonstrations of his wall map showing "The Natural Vegetation of Ohio."

Mr. Langran has recently been elected Treasurer of the Philadelphia Regional Chapter of the American Institute of Planners.

Dr. Penny is continuing his summer role as Consulting Biologist, making invertebrate and algal surveys of streams in Minnesota, Wisconsin, Missouri, Georgia and Wyoming. Both he and Dr. A.O. Dahl (Director of the Morris Arboretum) have contributed chapters to "Aspects of Palynology", a book which is scheduled for publication in the fall.

Mr. Tyrrell attended the meetings of the American Rhododendron Society at Calloway Gardens, Georgia, from April 19-23, where he delivered a lecture on "Companion Plants for Rhododendrons". He also addressed the annual meeting of the American Peony Society at Kingwood Center, Ohio, on June 14. Between June 28 and August 28 he visited England, France and Switzerland. His tour included an illustrated lecture on "Winterthur" before the Royal Horticultural Society on August 12.

On June 19 and 20 Dr. Zirkle attended the annual meeting of the Trustees of the Biological Stain Commission at Rochester, N.Y. and between July 13 and 16 he gave two lectures at the History of Biology Summer Institute which was held at Ohio State University.

Dr. and Mrs. Fogg attended the meetings of the American Cactus and Succulent Society in Pasadena from May 4 to 7. Between May 8 and June 6 they conducted a garden tour of Hawaii, Japan and Taiwan. A brief account of this tour will be found elsewhere in these pages. On August 1 Dr. Fogg gave a lecture on "The Barrens, Bogs and Beaches of South Jersey" before the Cape May Geographical Society.

TOWARD A VINE COLLECTION

With a few exceptions, such as *Clematis, Parthenocissus* and *Wisteria,* the numerous genera of woody vines have not been well represented at this Arboretum. Even in *Clematis,* with more than 40 species and scores of varieties hardy in our area, only a half dozen are grown here. When one adds *Akebia quinata, Decumaria barbara, Hydrangea petiolaris, Pueraria Thunbergiana, Celastrus scandens, Actinidia arguta* and *Lycium halimifolium* the list is about complete.

This paucity of woody climbers is not peculiar to this collection, but is common to many other arboreta and botanical gardens in this country and abroad. Few institutions have made such superb provision for the growing of vines as have the Arnold Arboretum and the Fairchild Tropical Garden or, to name another which comes readily to mind, the Botanic Garden of the University of Copenhagen.

There are several reasons to account for the situation. In the first place, vines require more space than shrubs. By their very manner of growth, they need some means of support, such as an arbor or a fence. Moreover, a few genera, such as *Clematis,* demand rather special attention.

With a view toward building up a truly representative collection of vines, the following few species have recently been acquired. Most of them have been placed along the fence that forms the southern boundary of the nursery area:

Aristolochia durior (A. macrophylla, A. Sipho). Dutchman's-pipe. A native of the eastern United States with large cordate leaves and strongly curved purple-brown flowers. Apparently less widely cultivated than formerly.

Polygonum Aubertii. Lace-vine. A vigorous climber from China, with panicles of whitish flowers in late summer.

Clematis montana var. *rubens.* This is one of the sturdiest and handsomest members of the genus. It differs from the type in having purplish leaves and bright pinkish flowers about 4 inches in diameter.

Ampelopsis brevipedunculata. Amur Ampelopsis. An Asiatic species valued for its brightly colored fruits which change from pale lilac through green to bright blue.

Actinidia chinensis. Chinese gooseberry. A stout vine with coarse reddish pubescence, large yellowish flowers and globose, hairy edible fruits. This species was highly praised by the late E. H. Wilson, who was largely responsible for its introduction from China.

Bignonia capreolata. Cross-vine. A species of rich woods from Maryland to Florida and Louisiana. The common name derives from the fact that in a transverse section of the stem the xylem arms form a Maltese cross. The corollas, which are about 2 inches long, are deep orange red on the outside and paler within.

Lonicera japonica var. *Halliana.* This variety differs from the type in having flowers which are pure white at first changing to yellow. Also, it is seemingly less agressive.

L. sempervirens. Trumpet honeysuckle, coral honeysuckle. A beautiful species, native to the eastern United States with long, tubular deep red to orange-yellow flowers. This certainly deserves to be much more widely grown than is the case.